The Pareto/Benthamite approach

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Weitzman

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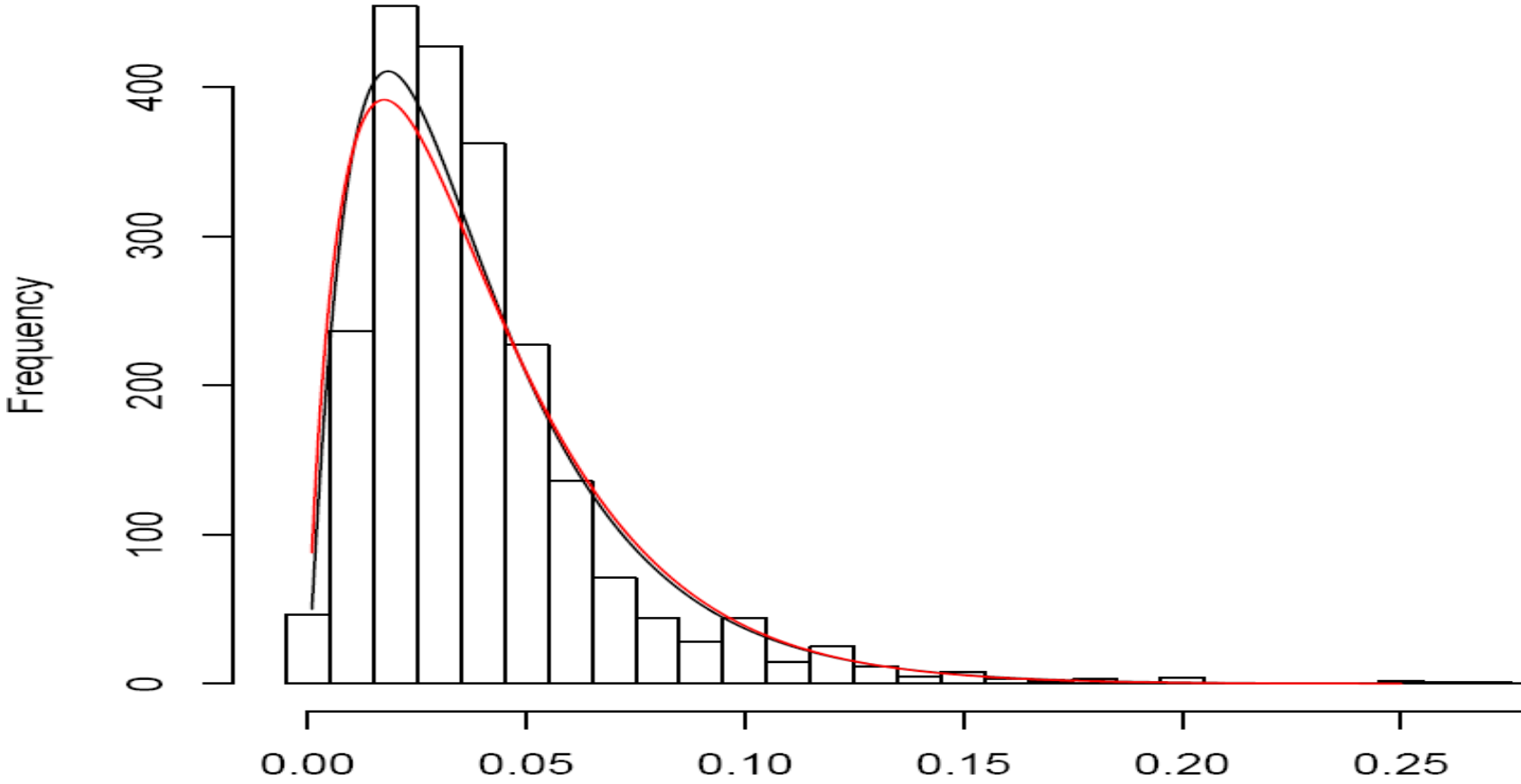

"Certainty equivalent approach"

Interpretation 1 (Scenarios)

- Each rate corresponds to a scenario on the growth rate
- $(\mu_1, p_1; ...; \mu_n, p_n)$

$$\begin{aligned} \exp(-r(t)t) &= \exp(-\rho t)\frac{E\left[u'(c_t)\right]}{E\left[u'(c_0)\right]} \\ r(t) &= \rho - \frac{1}{t}\ln\sum p_i \exp(-\theta\mu_i t) \\ &= -\frac{1}{t}\ln\sum p_i \exp(-r_i t) \end{aligned}$$

- If $r_i \sim \mathcal{N}\left(\rho + m, v^2\right)$ then $r = \rho + m - \frac{v^2}{2}t$ (Reinschmidt, 2002, utility discount rate)
- If $r_i \sim \gamma\left(\alpha, \beta\right)$ $\left(f(x) = \frac{\beta^\alpha}{\Gamma(\alpha)}x^{\alpha-1}\exp(-\beta x)\right)$ then $r(t) = \frac{\alpha}{\beta+t} = \frac{m^2}{m+tv}$

Interpretation 2 (Nocetti, J. and Napp, MS, 2008)

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- r_{soc}^{inst} such that $\int_0^t r_{soc}^{inst}(s)ds = r_{soc}^{average}(t)t$

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- MLR and PD dominated shifts in the distribution of the individual discount rates reduces $r_{soc}^{inst}(t)$